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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,259	04/14/2004	Joerg Wilken	H26983	6491

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EXAMINER	
GALE, KELLETTE	
ART UNIT	**PAPER NUMBER**
1621	

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/824,259	WILKEN ET AL.	
	Examiner	Art Unit	
	Kellette Gale	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 September 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-32* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-3, 6-10, 12, and 16-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al (Chem. Comm. 2002 1062-1063).

Appliant claims a process for the production of a compound comprising reacting a bromobenzene reactant with an alkyl acrylate in the presence of a palladium catalyst for a heck reaction, a base, and a phase-transfer catalyst to produce an alkyl cinnamate ester compound.

Determination of the scope and content of the prior art

(MPEP §2141.01)

Jacobs et al teaches a heck reaction wherein bromobenzene is reacted with n-butyl acrylate in the presence of a tributlamine base, a Pd-mordenite catalyst, and a

quaternary ammonium compound (Bu^n_4NBr). Toluene is incorportated as the solvent (please see Table 2, and *Reaction Conditions* at end of paper).

Ascertainment of the difference between the prior art and the claims

(MPEP §2141.02)

Jacobs et al does not disclose the end product. Also, some of the exact concentration ranges may not be reflected in Jacobs et al.

Finding of prima facie obviousness

Rational and Motivation (MPEP §2142-2143)

Although, Jacobs et al does not teach the product of the reaction in Table 2, it would have been obvious for one of ordinary skill in the art at the time of the present invention to expect that the reaction would follow the normal heck reaction mechanism wherein the acrylate compound is substituted at the bromo-substituent position.

Therefore one of ordinary skill in the art at the time of the present invention would be motivated to carry out the process as recited by Jacobs et al in order to arrive at the cinnamate ester compound as recited in claim 1.

Also, please note that merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claims 4, 5, 18, and 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al in view of Aizikovich et al (Russian Journal of Organic Chemistry, vol. 33, no. 4, 1997, pgs. 563-564).

Appliant claims a process for the production of a compound comprising reacting a bromobenzene reactant with an alkyl acrylate in the presence of a palladium catalyst for a heck reaction, a base, and a phase-transfer catalyst to produce an alkyl cinnamate ester compound, wherein the bromobenzene compound comprises 1-5 fluorine atoms.

Determination of the scope and content of the prior art

(MPEP §2141.01)

The scope and content of Jacobs et al can be found above. Aizikovich et al teaches a process wherein a difluoro-bromobenzene compound is reacted with a Pd catalyst and an alkyl acrylate compound in order to simulate a heck reaction so that the acrylate is substituted in the place of the bromine substituent (see col. 1).

Ascertainment of the difference between the prior art and the claims

(MPEP §2141.02)

Aizikovich et al's process utilizes acrylic acid to make a cinnamic acid via the claimed process.

Finding of prima facie obviousness

Rational and Motivation (MPEP §2142-2143)

Based on the teachings of Jacobs et al and Aizikovich et al, it is well known in the art to prepare a di-fluoro cinnamate ester compound in the presence of a palladium catalyst with a reasonable expectation that the acrylate compound will be substituted at the bromo-position. Therefore one of ordinary skill in the art would be motivated to do so based on the teachings of Jacobs et al and Aizikovich et al.

Claim 11 and 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al in view of Zhao et al (React. Kinet. Catal. Lett., vol. 81, no. 2, pgs 281-289).

Appliant claims a process for the production of a compound comprising reacting a bromobenzene reactant with an alkyl acrylate in the presence of a palladium catalyst for a heck reaction, a base, and a phase-transfer catalyst to produce an alkyl cinnamate ester compound, wherein the catalyst is selected from $Pd(Oac)_2$, $Pd(Cl)_2$, $Pd(PPh_3)_4$, $(PdCl_2(PhCN)_2)$, $Pd(dba)_2$ and Pd on carbon.

Determination of the scope and content of the prior art

(MPEP §2141.01)

The scope and content of Jacobs et al can be found above. Zhao et al teaches the process as claimed wherein the catalyst may be $Pd(OAc)_2$ (See table 4). Zhao et al does not teach the use of a phase transfer catalyst.

Finding of prima facie obviousness

Rational and Motivation (MPEP §2142-2143)

Since Zhao et al uses $Pd(Oac)_2$ as a catalyst in a Heck type reaction, it would be obvious for one of ordinary skill in the art at the time of the instant invention to incorporate the teachings of Zhao et al with that of Jacobs et al in order to prepare a cinnamate ester compound. One would be motivated to do so as Zhao et al shows that this catalyst may be used with a reasonable expectation of success in the Heck type reaction.

Claims 14-15 and 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al in view of Zhao et al as applied to claim 13 above, and further in view of Aizicovich et al.

Applicant claims the use of a di-fluoro-bromo-benzene compound and a $Pd(Oac)_2$ catalyst in the heck type reaction as taught by Jacobs et al.

Determination of the scope and content of the prior art

(MPEP §2141.01)

Prior art is applied here as applied above in previous rejections.

Ascertainment of the difference between the prior art and the claims

(MPEP §2141.02)

Jacobs et al does not teach the specifically claimed catalyst or the difluoro-bromobenzene compound to be used in the Heck type reaction.

Zhao et al does not teach the Heck type reaction in the presence of a difluoro-bromobenzene compound or the quarternary ammonia compound as a phase transfer catalyst.

Aizikovich et al teaches the Heck type reaction utilizing an acrylate acid in order to prepare cinnamate acid.

Finding of prima facie obviousness

Rational and Motivation (MPEP §2142-2143)

Since, Jacobs et al, Zhao et al, and Aizikovich et al all teach the Heck type reaction, showing the versality of such a reaction wherein different benzene substituents may be used as well as a plethora of Pd catalysts, one of ordinary skill in the art would

not only find it obvious to perform a Heck type reaction utilizing the teachings of Jacobs, Zhao, and Aizikovich et al as mentioned above, but one would also be motivated to do so in order to optimize process conditions in order to arrive at the desired products.

Also, please note that merely modifying the process conditions such as temperature and concentration is not a patentable modification absent a showing of criticality. In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955).

Claims 22-24, 26-27, and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al in view of Wada et al (60-112736).

Appliant claims a process for the production of a compound comprising reacting a bromobenzene reactant with an alkyl acrylate in the presence of a palladium catalyst for a heck reaction, a base, and a phase-transfer catalyst to produce an alkyl cinnamate ester compound. Applicant further claims the hydrolyzing of the alkyl cinnamate compound under basic or acidic conditions to produce cinnamic acid.

Determination of the scope and content of the prior art

(MPEP §2141.01)

The scope and content of Jacobs et al can be found above. Wada et al teaches the process of preparing cinnamic acid by hydrolyzing a cinnamic acid ester with water in the presence of an acid catalyst (please see abstract).

Ascertainment of the difference between the prior art and the claims

(MPEP §2141.02)

Jacobs et al does not teach the further hydrolyzation of the cinnamate ester compound produced.

Wada et al does not teach the preparation of a cinnamate ester compound.

Finding of prima facie obviousness

Rational and Motivation (MPEP §2142-2143)

Since Jacobs et al teaches the preparation of a cinnamate ester compound and Wada teaches the preparation of cinnamic acid via hydrolyzing a cinnamate ester compound, it would have been obvious for one of ordinary skill in the art at the time of the present invention to incorporate the teachings of both Jacobs and Wada et al. One would be motivated to do so if one were interested in furthering the production of a cinnamate ester compound in order to produce its cinnamic acid derivative.

Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al in view of Zhao et al and Wada et al.

Appliant claims a process for the production of a compound comprising reacting a bromobenzene reactant with an alkyl acrylate in the presence of a palladium catalyst for a heck reaction, a base, and a phase-transfer catalyst to produce an alkyl cinnamate ester compound, wherein the catalyst is selected from $Pd(Oac)_2$, $Pd(Cl)_2$, $Pd(PPh_3)_4$, $(PdCl_2(PhCN)_2)$, $Pd(dba)_2$ and Pd on carbon. Applicant further claims the hydrolyzing of the alkyl cinnamate compound under basic or acidic conditions to produce cinnamic acid.

Determination of the scope and content of the prior art

(MPEP §2141.01)

Prior art is applied here as applied above in previous rejections.

Ascertainment of the difference between the prior art and the claims

(MPEP §2141.02)

Jacobs et al does not teach the further hydrolyzation of the cinnamate ester compound produced.

Zhao et al does not teach the Heck type reaction in the presence of a difluoro-bromobenzene compound or the quarternary ammonia compound as a phase transfer catalyst.

Wada et al does not teach the preparation of a cinnamate ester compound.

Finding of prima facie obviousness

Rational and Motivation (MPEP §2142-2143)

Since Jacobs et al and Zhao et al teach the preparation of a cinnamate ester compound and Wada teaches the preparation of cinnamic acid via hydrolyzing a cinnamate ester compound, it would have been obvious for one of ordinary skill in the art at the time of the present invention to incorporate the teachings of both Jacobs and Wada et al. One would be motivated to do so if one were interested in furthering the production of a cinnamate ester compound in order to produce its cinnamic acid derivative.

Claims 29 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobs et al in view of Zhao et al and Wada et al as applied to claim 28 above, and further in view of Azikovich et al.

Applicant claims the use of a di-fluoro-bromo-benzene compound and a $Pd(Oac)_2$ catalyst in the heck type reaction as taught by Jacobs et al. Applicant further

claims the hydrolyzing of the alkyl cinnamate compound under basic or acidic conditions to produce cinnamic acid.

Determination of the scope and content of the prior art

(MPEP §2141.01)

Prior art is applied here as applied above in previous rejections.

Ascertainment of the difference between the prior art and the claims

(MPEP §2141.02)

Jacobs et al does not teach the specifically claimed catalyst or the difluoro-bromobenzene compound to be used in the Heck type reaction.

Zhao et al does not teach the Heck type reaction in the presence of a difluoro-bromobenzene compound or the quarternary ammonia compound as a phase transfer catalyst.

Aizikovich et al teaches the Heck type reaction utilizing an acrylate acid in order to prepare cinnamate acid.

Wada et al does not teach the preparation of a cinnamate ester compound.

Finding of prima facie obviousness

Rational and Motivation (MPEP §2142-2143)

Since Jacobs et al, Zhao et al, and Aizikovich et al all teach the preparation of a cinnamate ester compound and Wada teaches the preparation of cinnamic acid via hydrolyzing a cinnamate ester compound, it would have been obvious for one of ordinary skill in the art at the time of the present invention to incorporate the teachings of both Jacobs and Wada et al. One would be motivated to do so if one were interested

in furthering the production of a cinnamate ester compound in order to produce its cinnamic acid derivative.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kellette Gale whose telephone number is (571) 272-8038. The examiner can normally be reached on M-F (6:30am-3:00pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thurman Page can be reached on (571) 272-0602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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